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**REMARKS**

By this amendment, claims 1-5, 7, 8 and 14 have been canceled and claims 6 and 9 have been amended. Claims 6 and 9-13 remain pending in the application for further consideration by the Examiner. In view of the amendments and the remarks that follow, it is believed that the application stands in condition for allowance and, as such, Applicant respectfully requests entry of this Amendment After Final and passage of the case to issue.

**35 U.S.C. 102(b) Rejection**

Claims 1-7 and 14 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,608,682 ("Nagashima et al."). Claims 1-5, 7, 8 and 14 have been canceled. Claim 6 has been amended to include the limitations of dependent claims 7 and 8. Because claim 8 was not rejected as being anticipated by Nagashima et al., presently amended claim 6, which includes all the limitations of original claims 7 and 8, is therefore also not anticipated and the rejection under 35 U.S.C. §102(b) should be withdrawn accordingly.

**35 U.S.C. 103(a) Rejection**

Claims 8 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Nagashima et al. Claim 8 has been canceled by this amendment and claim 6 has been amended to include all the limitations of claims 7 and 8. Accordingly, the present rejection will be discussed in the context of newly amended claim 6 and claim 9. As set forth in the remarks that follow, Applicant submits that claim 6, as amended, is patentable over Nagashima et al.

The Examiner is correct that Nagashima et al. (col. 7, line 59 to col. 8, line 14) discloses an optical detector arranged to detect the optical power content of a bistable semiconductor waveguide device and to provide a feedback signal to the electrode of the bistable device to control the bistable device. This feedback is such as to have the electrode at a high potential when the optical input is above a threshold level or have the electrode at a lower potential when the optical input is below the threshold level (see, e.g., col. 8, lines 7 to 11). The Examiner is also correct that Nagashima et al. does not disclose that the bistable semiconductor waveguide device could be replaced by a laser on this feedback configuration nor there being a controller arranged to generate a current control signal in dependence on the feedback signal.

The Examiner essentially argues that it would have been obvious for the skilled artisan to replace the semiconductor waveguide device in the feedback configuration with a laser device, and to route the feedback signal to a controller of the injection current level for the laser. However, Applicant respectfully disagrees and instead submits that one of ordinary skill in the art, upon reading Nagashima et al., would not be motivated to attempt this substitution, it being contrary to the teaching of Nagashima et al. Furthermore, even assuming the skilled artisan

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would be motivated to make such a substitution, which Applicant does not believe to be the case, the resulting combination would not result in the claimed invention.

In particular, Nagashima et al. discloses a first embodiment including lasers and a second embodiment that, according to Nagashima et al. (see, e.g., col. 7, lines 43-47), "differs from the embodiment of FIG. 2 in that the injection-current controlled bistable lasers 81-84 are replaced with optical directional couplers 181-184 having closed loops." The idea of using lasers having closed loops, i.e., feedback loops, therefore would run directly contrary to this teaching in Nagashima et al.

Furthermore, the "laser" embodiment in Nagashima et al. operates such that feedback would not help. The injection current of the laser is kept at  $i_b$  when the laser is in either of the stable states (A, B) (see, e.g., FIG. 3b of Nagashima et al.). As long as the injection current is  $i_b$ , if the optical input is low, then the optical output is also low (state A, FIG. 3b), but if the optical input is high, then the optical output is high (state B, FIG. 3b). The optical output remains the same indefinitely when the injection current is around  $i_b$  because the laser then acts as a true bistable. Accordingly, feedback to adjust injection current is not needed nor useful. The skilled artisan would appreciate this and therefore would have no motivation to seek to attempt to use feedback in the "laser" embodiment described in Nagashima et al.

By contrast, the claimed invention is different and provides significant advantages. For example, laser devices are operated, according to the principles of the invention, such that injection current is an unstable region close to the threshold current value. Accordingly, feedback is then appropriate for correct operation (see, e.g., Applicant's specification, page 8, lines 21 to 28). Claim 6, as amended, recites this feature of Applicant's invention, e.g., "an optical detector arranged to detect optical power content of said semiconductor laser element and to provide a feedback signal to said controller, said controller being arranged to generate said current control signal [to control amplitude of the injection current] in dependence on said feedback signal" (emphasis added).

In view of the foregoing, Applicant respectfully submits that claim 6 is patentable over Nagashima et al. Because claim 9 depends from amended claim 6, claim 9 is therefore believed to be patentable for the same reasons set forth above for claim 6 as well as for other novel features therein. Accordingly, Applicant respectfully requests that the rejections be withdrawn.

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**35 U.S.C. 103(a) Rejection**

Claims 10-13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Nagashima et al. in view of U.S. Patent No. 6,104,477 ("Yoshida et al."). Applicant respectfully traverses this rejection.

Claims 10-13 are dependent from base claim 6 and therefore include all the limitations of base claim 6. Consequently, the foregoing remarks corresponding to the preceding 35 U.S.C. 103(a) rejection of claim 6 (corresponding to original claim 8) in view of Nagashima et al. apply equally to dependent claims 10-13 and are incorporated by reference accordingly.

In particular, because the Nagashima et al. reference does not teach or suggest each and every limitation of base claim 6, as amended, and because the Yoshida et al. reference does not supply the missing limitations and therefore does not cure the deficiencies of the Nagashima et al. reference, dependent claims 10-13 are therefore believed to be patentable for the same reasons set forth above for base claim 6 in the preceding rejection as well as for other novel features therein. Applicant therefore respectfully requests that the Examiner withdraw the rejection of claims 10-13 under 35 U.S.C. §103(a).

**Conclusion**

In view of the foregoing, Applicant believes that all pending claims stand in condition for allowance. Accordingly, Applicant respectfully requests entry of this Amendment After Final, reconsideration of the application, and passage of the case to issue. Any questions can be directed to the Applicant's attorney at the number below.

Respectfully submitted,

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